discs, flash memories, or forms of electrically programmable memories (EPROM) or electrically erasable and programmable (EEPROM) memories.

[0048] All references, including publications, patent applications, and patents, cited herein are hereby incorporated by reference to the same extent as if each reference were individually and specifically indicated to be incorporated by reference and were set forth in its entirety herein.

[0049] The use of the terms "a" and "an" and "the" and "at least one" and similar referents in the context of describing the disclosed subject matter (especially in the context of the following claims) are to be construed to cover both the singular and the plural, unless otherwise indicated herein or clearly contradicted by context. The use of the term "at least one" followed by a list of one or more items (for example, "at least one of A and B") is to be construed to mean one item selected from the listed items (A or B) or any combination of two or more of the listed items (A and B), unless otherwise indicated herein or clearly contradicted by context. The terms "comprising," "having," "including," and "containing" are to be construed as open-ended terms (i.e., meaning "including, but not limited to,") unless otherwise noted. Recitation of ranges of values herein are merely intended to serve as a shorthand method of referring individually to each separate value falling within the range, unless otherwise indicated herein, and each separate value is incorporated into the specification as if it were individually recited herein. All methods described herein can be performed in any suitable order unless otherwise indicated herein or otherwise clearly contradicted by context. The use of any and all examples, or example language (e.g., "such as") provided herein, is intended merely to better illuminate the disclosed subject matter and does not pose a limitation on the scope of the invention unless otherwise claimed. No language in the specification should be construed as indicating any non-claimed element as essential to the practice of the invention.

[0050] Certain embodiments are described herein. Variations of those embodiments may become apparent to those of ordinary skill in the art upon reading the foregoing description. The inventors expect skilled artisans to employ such variations as appropriate, and the inventors intend for the embodiments to be practiced otherwise than as specifically described herein. Accordingly, this disclosure includes all modifications and equivalents of the subject matter recited in the claims appended hereto as permitted by applicable law. Moreover, any combination of the above-described elements in all possible variations thereof is encompassed by the disclosure unless otherwise indicated herein or otherwise clearly contradicted by context.

1. A gas exchange analysis system, the system comprising:

a first water vapor sensor configured to receive the flow of a gas from a first gas flow line and configured to measure a first concentration of water vapor in the gas received from the first gas flow line;

a sample chamber configured to hold a sample capable of adding or removing water from the gas;

a second water vapor sensor configured to measure a second concentration of water vapor in the gas exiting the sample chamber; and

a water buffering component in the first gas flow line before the first water vapor sensor, the water buffering component including a material configured to buffer water vapor content in the flow of the gas, whereby fluctuations in water vapor content in the flow of the gas are slowed for components downstream from the water buffering component in the gas exchange system.

2. The system of claim **1**, wherein the material absorbs or desorbs water in the presence of a water concentration gradient.

3. The system of claim **2**, wherein the material includes a Nafion structure.

4. The system of claim **3**, wherein the structure is selected from the group consisting of a bead, a tube and a flat membrane.

5. The system of claim **2**, wherein the material includes one or a plurality of Nafion beads.

6. The system of claim **1**, wherein the water buffering component includes a mechanism to dynamically adjust an amount of the material in the gas flow line.

7. The system of claim **1**, wherein the gas exchange measurement system is a leaf porometer.

8. The system of claim **1**, wherein the sample includes a photosynthesis and/or transpiration capable material.

9. The system of claim **1**, the first water vapor sensor includes one of a capacitive sensor, a resistive sensor, a thermal-conductivity-based sensor, an optical absorption gas analyzer, or a laser-based gas analyzer and wherein the second water vapor sensor includes one of a capacitive sensor, a resistive sensor, a thermal-conductivity-based sensor, an optical absorption gas analyzer, or a laser-based gas analyzer.

10. A method of buffering water content in a gas exchange measurement system, the method comprising:

providing an incoming airstream to a first water vapor sensor;

buffering water vapor content in the incoming airstream using a water buffering component that absorbs or desorbs water in the presence of a water concentration gradient, whereby fluctuations in water vapor content in the incoming airstream are slowed for the first water vapor sensor and other components downstream from the water buffering component in the gas exchange measurement system.

11. The method of claim **10**, wherein the water buffering component includes a Nafion material.

12. The method of claim **11**, wherein the Nafion material has a structure selected from the group consisting of a bead, a tube and a membrane.

13. The method of claim **10**, wherein the water buffering component includes one or a plurality of Nafion beads.

14. The method of claim **11**, further including dynamically adjusting an amount of surface area of the Nafion material exposed to the incoming airstream.

15. The method of claim **10**, wherein the first water vapor sensor is configured to measure a first concentration value of water vapor in the airstream entering a sample chamber, and wherein the other components downstream of the water buffering component include at least:

the sample chamber, configured to hold a sample capable of adding or removing water from the airstream, and

a second water vapor sensor configured to measure a second concentration value of water vapor in the airstream exiting the sample chamber.

16. The method of claim **15**, the first water vapor sensor includes one of a capacitive sensor, a resistive sensor, a thermal-conductivity-based sensor, an optical absorption gas